

**AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the application.

**Listing of Claims**

Claims 1-24 (Canceled)

25. (Previously Presented) A device for investigating reactions between interactive chemical or biological species, said device comprising:

a substrate comprising a film of free electron metal consisting essentially of gold;

and

a plasma layer comprising sulfur plasma deposited directly on said gold film of said substrate and defining a stable deposited plasma layer.

26. (Canceled)

27 (Canceled)

28. (Canceled)

29. (Previously Presented) The device according to claim 25, wherein the plasma deposited layer, comprises one or more chemical or biological functional groups.

30. (Previously Presented) The device according to claim 29, further comprising one or more wet chemically deposited layer(s), arranged on the plasma deposited layer.

31. (Previously Presented) The device according to claim 25, wherein the plasma layers comprise one or more compounds selected from the group consisting of sulfur-containing compounds, thiols, sulfides, disulfides and diallyl sulfide.

32. (Previously Presented) The device according to claim 31, wherein the substrate consists essentially of gold.

33. (Previously Presented) A process for producing a device for investigating reactions between interactive chemical and biological species, said process comprising the steps of (a) providing a pre-selected substrate, said substrate comprising a film of free electron metal consisting essentially of gold and (b) arranging a layer comprising sulfur plasma directly on the gold film by plasma deposition and defining a stable deposited plasma layer.

34. (Currently Amended) The process according to claim 33, wherein the substrate consists essentially of gold, and wherein the plasma layer is directly deposited onto the substrate ~~or onto a metal film arranged on the substrate.~~

35. (Currently Amended) The process according to claim 33, wherein plasma is deposited from a monomer/oligomer/polymer in gas form, ~~preferably being a monomer~~, said monomer being saturated, partially saturated or unsaturated.

36. (Previously Presented) The process according to claim 33, wherein the substrate is subjected to a pre-cleaning step comprising pre-treating the substrate by means of a plasma etching step before the plasma deposition step.

37. (Previously Presented) The process according to claim 33, wherein the gas plasma is deposited under the following conditions:

- a discharge power of up to 5000 W;
- an exposure duration of up to 1000 s;

- a plasma gas flow of up to 10000 cm<sup>3</sup>/min;
- a pressure of up to 1 bar; and
- a frequency covering DC, AC, RF, and the MW ranges.

38. (Previously Presented) The process according to claim 37, wherein the gas plasma is deposited under the following conditions:

- a discharge power of up to 500 W;
- an exposure duration of up to 100 s;
- a plasma gas flow of up to 100 cm<sup>3</sup>/min;
- a pressure between 0.001-50 mbar; and
- a frequency between 2-60 Mhz,

wherein the discharge power is pulsed to the plasma, the pulse discharges being separated by up to 100 s.

39. (Previously Presented) The process according to claim 37, wherein the substrate is treated in an acid flow.

40. (Previously Presented) The process according to claim 38, wherein following pulse discharge, the substrate is after-treated with a pre-selected gas.

41. (Currently Amended) The process for providing a device according to claim 33, suitable for investigating reactions between interactive bio/chemical species by means of surface plasmon resonance spectroscopy, said process comprising the steps of:

- preselecting a free electron metal substrate, which metal substrate is suitable for allowing investigation by surface plasmon resonance spectroscopy, arranging a pre-selected first functional group species on the free electron metal substrate by means of plasma deposition, which first functional group species protects the free electron metal substrate from a second functional group species whose interaction with the plasma deposited first functional group species can be investigated, thereby preventing undesirable interactions between the free electron

metal substrate and the second functional group species, and which first functional group species provides a ~~desired~~ functionality for the second functional group species; and

subsequently arranging a second functional group species on the plasma deposited layer of the first functional group species, whereafter interaction between the first and second functional group species layers, can be investigated by means of surface plasmon resonance spectroscopy.

42. (Currently Amended) The process for providing a device according to claim 33, suitable for investigating reactions between interactive bio/chemical species by means of surface plasmon resonance spectroscopy, said process comprising the steps of:

preselecting a free electron metal substrate, which metal substrate is suitable for investigating and sensing surface interactions by surface plasmon resonance spectroscopy, arranging a pre-selected first functional group species on the free electron metal substrate by means of plasma deposition, which first functional group species protects the free electron metal substrate from a second functional group species whose interaction with the plasma deposited first functional group species can be investigated, thereby preventing undesirable interactions between the free electron metal substrate and the second functional group species, and which first functional group species provides a ~~desired~~ functionality for the second functional group species.

43. (Previously Presented) The process according to claim 41, wherein before being exposed to the second functional group species, a bio/chemical functional layer is wet chemically arranged on the plasma deposited first functional group species layer, said wet chemically arranged functional layer being pre-selected for its specificity for the second functional group species and for the prevention of non specific interactions with the said second functional group species.

44. (Currently Amended) A method for investigating the interaction, of pre-determined chemical or biological species, comprising the ~~steps~~step of analyzing the interaction between ~~the~~chemical or biological species arranged on a device according to claim 25.

45. (Currently Amended) A method for investigating the reaction between chemically interactive species, ~~wherein the~~comprising the step of exposing or depositing chemical or biological species ~~are exposed to or deposited on~~ the device of claim 25.

46. (Currently Amended) A method for investigating reactions between interactive bio/chemical species, by means of surface plasmon resonance spectroscopy, by the device of claim 25, wherein the ~~device method~~comprises at the steps of pre-selectedpre-selecting a free electron metal substrate consisting essentially of gold, and a pre-selected, sulfur plasma deposited layer, ~~and arranged~~arranging on the free electron metal substrate the pre-selected sulfur plasma deposited layer, which plasma deposited functional group species having both attachment ability to the free electron metal substrate, and specificity to further functional group species, whereby the interaction therebetween is investigatable by means of surface plasmon resonance spectroscopy.

47. (Currently Amended) The method of claim 46, ~~wherein the pre-selected free electron metal substrate consists essentially of gold, and~~ wherein the sulfur plasma deposited layer comprises one or more ~~sulphur~~sulfur compounds.

48. (Previously Presented) The process according to claim 40, wherein the layer arranged by plasma deposition comprises at least one functional group species, and wherein the gas comprises the at least one functional group species.